SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product:	Molicel - Cobalt based Lithium-ion cell	P.I.N.: Not Regulated
Use:	High performance lithium-ion rechargeable battery system.	W.H.M.I.S.: exempt. manufactured article

Manufacturer: **E-One Moli Energy**
(Canada) Limited
20,000 Stewart Cres.
Maple Ridge, BC,
Canada V2X 9E7
(604) 466-6654
FAX: **(604) 466-6600**

24 HOUR EMERGENCY NUMBER

(604) 466-6654
(MOLI)

SECTION 2 - HAZARDOUS INGREDIENTS

Hazardous Ingredients	%	CAS Number	LD_{50}(mg/kg) (oral-rat)	LC_{50} (mg/L)
Aluminium foil	0.1- 1 w/w	7429-90-5	N/AV	N/AV
Biphenyl (BP)	0.1-0.3 w/v	92-52-4	2400	N/AV
Copper foil	0.1- 1 w/w	7440-50-8	3.5 (ipr-mouse)	N/AV
Linear and Cyclic Carbonate Solvents (see 'Other Information')	5- 17w/w	N/APP	~11000 (weighted avg)	N/AV
Graphite, powder	10- 30 w/w	7440-44-0	440 (ivn-mouse)	N/AV
Lithium Cobaltite ($LiCoO_2$)	10- 30 w/w	12190-79-3	N/AV	N/AV
Lithium Hexaflurophosphate ($LiPF_6$)	1- 5 w/w	21324-40-3	1702	Rat: >20
Poly (vinylidene fluoride) (PVDF)	0.1- 1 w/w	24937-79-9	N/AV	N/AV
Steel, nickel and inert polymer	Balance	N/APP	N/APP	N/APP

SECTION 3 - PHYSICAL DATA

Physical state: Nickel plated metal cannister under label	Odour None	Odour threshold: N/APP

Vapour pressure (mmHg) N/APP	Vapour Density (air =1) N/APP	Evaporation rate : N/APP	Boiling Point N/APP	Freezing point N/APP
pH (10% in water) N/APP	Specific gravity: 1.5-2.0	Coeff. of water/oil distribution N/APP	Water solubility: insoluble	Percent Volatiles: NONE

SECTION 4 - FIRE AND EXPLOSION DATA

Flammability NO	Conditions: Organic components will burn if cell incinerated. Combustion of cell contents will cause evolution of Hydrogen Fluoride.

Means of Extinction and Special Procedures:

Water spray, Carbon Dioxide, Dry chemical powder or appropriate foam. Use agent appropriate for surrounding materials.

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Extremely corrosive Hydrogen Fluoride gas is produced upon combustion of cell contents.

Flashpoint: NONE	Upper Flammable Limit: NONE	Lower Flammable Limit: NONE

Auto-ignition Temp. NONE	Hazardous Combustion Products: Hydrogen Fluoride, Phosphorus Oxides, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Cobalt Oxides, Aluminum Oxide, possible fluoro-compounds, Carbon soot
Impact sensitive: NO	Static Discharge Sensitive: NO, but cell may contain up to 4.2 volts.

SECTION 5 - REACTIVITY DATA

Stability: STABLE	Hazardous polymerization will not occur. Spontaneous decomposition at normal temperatures will not occur.

Incompatibilities:

Do not crush, puncture, incinerate, immerse in water or heat over 100°C. Steel casing slowly dissolves in strong mineral acids.

Reactivities:

None known

Hazardous Decomposition Products:

Hydrogen Fluoride, Boron Oxide, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Cobalt Oxides, Aluminum Oxide, possible fluoro-compounds, Carbon soot

SECTION 6 - TOXICOLOGICAL PROPERTIES

Routes of Entry:
Skin Contact: NO Skin Absorption NO Eye contact: NO Inhalation NO Ingestion NO

Acute Exposure

Skin:	No effect noticed in routine handling of product.
Eyes:	The bulk solid has no effect on the eye.
Inhalation:	Not applicable.
Ingestion:	Ingestion is not likely, given the physical size and state of the cell.

Chronic Exposure

Skin:	None anticipated.
Eyes:	Not applicable.
Inhalation:	Not applicable.
Ingestion:	Ingestion is not a likely exposure route.

Exposure Limits	Irritancy:	Sensitization:	Carcinogenicity
None listed	None	Not anticipated	Not anticipated

Teratogenicity:	Mutagenicity:
Not anticipated	Not anticipated.

Reproductive toxicity:	Synergistic Products:
Not anticipated	None expected

SECTION 7- PREVENTIVE MEASURES

Personal protective equipment:

Gloves:	Respirator:	Eyewear:
Not required for handling individual cells. Fabric gloves for warehouse container handling.	No respirator required for normal handling. SCBA required for fires.	Not required beyond employer policy.

Clothing:	Footwear:
Standard industrial clothing in normal use. Impervious suit in fires.	Wear steel-toed footwear if large containers of cells are being handled.

Engineering controls:

Keep away from heat and open flames. Store in a cool, dry place.

Leak and spill procedure:

Evacuate area if fire present or likely. Wear SCBA for fire-related emergencies. Using gloves, pick up or sweep up fire-damaged cells, bag individually in plastic bags and place in closed metal containers. 205 Litre lined steel drums are appropriate. Cardboard boxes may be used for small quantities. Avoid raising dust while sweeping. Transport container outdoors. Hold burned cells and fire cleanup solids for disposal as potential hazardous waste. Unburned cells are not hazardous waste.
A fire with over 100 kg of cells burnt will likely require reporting to environment officials. Always consult and obey all international, federal and local environmental laws.

Waste disposal:

Always consult and obey all international, federal, provincial/state and local hazardous waste disposal laws. Some jurisdictions require recycling of this spent product.

Handling procedures and equipment:

Store in a cool, dry place away from sparks and flame. Keep below 125°C. Keep above -60°C. Charge between 0°C and 45°C. Use only approved charging equipment. Do not disassemble battery or battery pack. Do not puncture, crush or dispose of in fire.

Storage requirements:

Store at room temperature for best results.

Special Shipping Information:

Not regulated. This product is made from materials with no detectable mercury.

SECTION 8 - FIRST AID MEASURES

Skin:	Not a health hazard.
Eyes:	Not an eye hazard
Inhalation:	Not an inhalation hazard.
Ingestion:	If swallowed, seek emergency medical aid. If patient choking and can partially breathe, encourage patient to cough. Do not strike patient's back. This may lodge cell further in throat. If patient is not breathing, perform standing Heimlich manoeuvre until object is dislodged or patient becomes unconscious. An unconscious patient should be lowered gently to the floor on their back and abdominal thrusts performed continuously until cell is ejected from throat or medical aid arrives.

SECTION 9 - PREPARATION INFORMATION

Prepared by: Martin RIDGWAY, B.Sc.	Phone:	Date Created:	Revision Information:

Safety Co-ordinator	(604) 466-6654	Mar 31, 1995	First Issue
		Date Last Revised: Jul 31, 1998	Revision Information: Assign document control number. Company name change.
		Date Last Revised: Jun 15, 2000	Revision Information: Company name change.
		Date Last Revised: Jan 23, 2001	Revision Information: Shipping: Contains no mercury.
		Date Last Revised: May 1, 2001	Revision Information: Incompatibilities – Do not heat over 100C (to match UL warning statement)
Approval			

OTHER INFORMATION

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. Exact composition information is immediately available on a confidential basis to medical professionals treating exposure to cell components or combustion by-products.

HYDROFLUORIC ACID EXPOSURE DURING FIRE FIGHTING

This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate Molicels. This section is provided solely in case of exposure, during fire fighting, to the combustion by-products. Hydrofluoric acid is not present in the product. Contact with Molicels causes none of the following symptoms.

Hydrofluoric acid is extremely corrosive. Contact with hydrogen fluoride fumes is to be avoided. Permissible exposure limit is 3 ppm. In case of contact with hydrogen fluoride fumes, immediately leave the area and seek first aid and emergency medical attention. Symptoms may have delayed onset. Fluoride ions penetrate skin readily causing destruction of deep tissue layers and even bone. Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations. Immediately flush eyes or skin with water for at least 20 minutes to neutralize the acidity and remove some fluoride. Remove and destroy all contaminated clothing and permeable personal possessions. Before re-use, impermeable possessions should be soaked in benzalkonium chloride after water washing. Following flushing of the affected areas, an iced aqueous solution of benzalkonium chloride or 2.5 % calcium gluconate gel should be applied to react with the fluoride ion. Compresses and wraps may be used for areas where immersion is not practical. Medicated dressing should be changed every 2 minutes. Exposure to hydrofluoric acid fumes sufficient to cause pain requires immediate hospitalization for monitoring for pulmonary edema.